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(54) Title: YEAST STRAINS

## (57) Abstract

Process for increasing the rate of production of carbon dioxide, ethanol and other fermentation products such as citric acid, produced by yeast such as *Saccaromyces cerevisiae* during fermentation and decreasing biomass production by regulating the rate of glycolysis indirectly through changing the energy balance of the cell, i.e. by reducing intracellular ATP levels. Modifications for so altering the glycolysis rate involve the use of either a regulated ATP hydrolysis within the cell or a regulated leakage of ATP from the cell. This invention encompasses several ways for altering the yeast ATP level including (a) engaging futile metabolic cycles to increase ATP consumption; (b) using an altered exocellular acid phosphatase so that it becomes intracellular to increase intracellular ATP hydrolysis; (c) using a drug which uncouples the plasma membrane ATPase thereby consuming an abnormally high level of ATP; and (d) using a drug which allows the release of ATP from the cell to lower the intracellular ATP level. This invention further encompasses regulating the genetic modifications described in greater detail herein. By these means, such modifications may be turned off during growth of the yeast on a commercial scale, and then turned on before or during, and preferably before or at a very early stage of, the dough-rising phase.

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